

C L A I M S

1. A vacuum processing apparatus, comprising a vacuum processing chamber having a stage mounting a substrate to be processed; and a carrier port provided
5 on a peripheral wall of the vacuum processing chamber, and carrying the substrate onto and off the stage, for generating plasma in the vacuum processing chamber and for subjecting the substrate on the stage to a plasma
processing, characterized by comprising:

10 a shutter retreated when the substrate is delivered onto the stage and delivered to an outside of the stage, disposed to cover a surrounding of the stage and to surround a plasma generation region while closing the carrier port when the plasma is generated
15 in the vacuum processing chamber to thereby prevent the disturbance of the plasma.

2. A vacuum processing apparatus according to claim 1, characterized in that

20 the shutter is a cylindrical member along an inner peripheral wall of the vacuum processing chamber, the shutter raised by a shutter driving mechanism to close the carrier port when the plasma is generated in the vacuum processing chamber.

25 3. A vacuum processing apparatus according to claim 2, characterized in that

the shutter driving mechanism is constituted of an air cylinder disposed on an atmospheric area side, and

a driving shaft elevated by the air cylinder to elevate the shutter.

4. A vacuum processing apparatus according to claim 1, characterized in that

5 the shutter is a plate member along an inner peripheral wall of the vacuum processing chamber, the shutter raised by a shutter driving mechanism to close the carrier port when the plasma is generated in the vacuum processing chamber.

10 5. A vacuum processing apparatus according to claim 3, characterized in that

 the shutter driving mechanism is constituted out of the air cylinder disposed on the atmospheric area side, and the driving shaft elevated by the air
15 cylinder and elevating the shutter.

6. A vacuum processing apparatus according to claim 1, characterized in that

 a potential of the shutter is grounded.

20 7. A vacuum processing apparatus according to claim 1, characterized in that

 the shutter has a heating mechanism.

8. A vacuum processing apparatus, comprising a vacuum processing chamber having a stage mounting a substrate to be processed; and a carrier port provided
25 on a peripheral wall of the vacuum processing chamber, and carrying the substrate onto and off the stage, for generating plasma in the vacuum processing chamber and

for subjecting the substrate on the stage to a plasma processing, characterized by comprising:

5 a deposit shield fixed on an outer periphery of the stage to cover an inner peripheral wall of the vacuum processing chamber, and having a notch portion facing the carrier port for carrying the substrate onto and off the stage; and

a shutter fitted into the notch portion and freely elevated, and characterized in that

10 the shutter is retreated when the substrate is delivered onto the stage and delivered to an outside of the stage, and fitted into the notch portion when a plasma processing is conducted, and a plasma generation region is surrounded by an even curve, thereby

15 generating uniform plasma.

9. A vacuum processing apparatus according to claim 8, characterized in that

on an end face of the shutter fitted into the notch portion of the deposit shield,

20 the end face is formed to have a flat surface;

a groove for fitting an O ring thereinto is formed on the stage side, and a groove for fitting a spiral seal made of metal thereinto is formed on an outer periphery on the stage side; and

25 when the shutter is fitted into the notch portion of the deposit shield, the deposit shield and the shutter is electrically connected to each other through

the spiral seal.

10. A vacuum processing apparatus according to claim 8, characterized in that

on an end face of the shutter fitted into the
5 notch portion of the deposit shield,

the end face is formed to have an L-shape to be engaged with an end face of the notch portion so as to have a convex outer periphery on the end face of the

shutter;

10 a groove for fitting a spiral seal made of metal thereinto is formed on the end face of the convex portion of the shutter is formed; and

when the shutter is fitted into the notch portion of the deposit shield, a concave portion of the deposit
15 shield and the convex portion of the shutter are electrically connected to each other through the spiral seal.

11. A vacuum processing apparatus according to claim 8, characterized in that

20 each of the deposit shield and the shutter comprises a heating mechanism.

12. A vacuum processing apparatus according to claim 8, characterized in that

the deposit shield and the shutter have a ground
25 potential.

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7. A vacuum processing apparatus, comprising a vacuum processing chamber having a stage mounting a substrate to be processed; and a carrier port provided on a peripheral wall of the vacuum processing chamber, and carrying the substrate onto and off the stage, for generating plasma in the vacuum processing chamber and for subjecting the substrate on the stage to a plasma processing, characterized by comprising:
- 5 a deposit shield disposed along an inner peripheral wall of the vacuum processing chamber; and
- 10 a shutter disposed to be able to be elevated along the inner peripheral wall of the vacuum processing chamber, and characterized in that
- 15 each of the deposit shield and the shutter has a grounded potential, the shutter is retreated when the substrate is delivered into and outside through the carrier port and displaced to be abutted on the deposit shield when the plasma processing is conducted, and a plasma generation region is surrounded by an even
- 20 curve, thereby generating uniform plasma.
8. (Amended) A vacuum processing apparatus according to claim 7, characterized in that

the shutter is raised by a shutter mechanism to be fitted into the notch portion to thereby close the carrier port when the plasma is generated in the vacuum processing chamber.

5 9. (Amended) A vacuum processing apparatus according to claim 7, characterized in that

the deposit shield is a cylindrical member having a notch portion, along the inner peripheral wall of the vacuum processing chamber;

10 the shutter is a plate member along an inner surface of the deposit shield and formed to be fitted into the notch portion; and

when the plasma is generated in the vacuum processing chamber, the shutter is pushed up toward the notch portion to close a front of the carrier port and
15 an inner surface of the shutter forms a same curve as a curve of the inner surface of the deposit shield.